Ecological Sensitivity Targeting and Assessment Tool (ESTAT)

ESTAT is a user-friendly Geographic Information System (GIS) tool for modeling, analyzing, and mapping contaminant releases from Environmental Protection Agency (EPA)-regulated facilities. ESTAT is designed to give the analytical power of sophisticated GIS tools to people with little or no GIS experience. Through pull-down menus, users can create maps by combining data from EPA-regulated facilities (such as Permit Compliance System [PCS] loadings estimates and estimates of loadings above permit limits for 1990 through 1995, Toxic Release Inventory System (TRIS) releases for 1990 through 1995, Aerometric Information Retrieval System/AIRS Facility Subsystem [AIRS/AFS] stack releases to air, Biennial Reporting System [BRS] facility and hazardous waste data for 1991 and 1993, and Resource Conservation Recovery Information System [RCRIS] and Comprehensive Environmental Response, Compensation, and Liability Information System [CERCLIS] facility locations), with a variety of boundary files for features such as roads, rivers, watersheds, ecoregions, National Parks, National Wildlife Refuges, schools, and hospitals, as well as block (Public Law [P.L.] 94-171) and block group (Summary Tape Files [STF]-3A) demographic data. ESTAT also maps the occurrence of threatened and endangered species at the county level.

ESTAT maps and models the air dispersion and downstream water dilution of contaminants that may affect important ecological areas such as National Wildlife Refuges and National Parks. ESTAT displays a national map (Conterminous United States [CONUS]), from which users can zoom in on any area of CONUS, map the location of EPA-regulated facilities, and either aggregate facility release data by county, watershed, or ecoregion, or display proportional releases by individual facility. ESTAT can also print hardcopy maps and tabular data reports.

Air Dispersion Modeling - The ISCLT2 Model: ESTAT uses the Industrial Source Long Term model, Second Edition (ISCLT2) to model dispersion and airborne concentrations of contaminants from TRI and AFS facilities. ESTAT uses ISCLT2 to model individual contaminants from multiple emission sources simultaneously. ISCLT2 estimates a grid pattern of concentration points that is converted to concentration isolines and mapped by ESTAT. The user can select a National Wildlife Refuge and model concentrations from sources within a 50 kilometer radius, model concentrations from individual facilities, or model concentrations from all facilities within a particular study area. Air modeling results can be overlaid on census data displayed at the block enumeration level to determine potential human exposure to airborne pollutants.

Water Modeling with ESTAT: ESTAT uses the Pollutant Routing Model (PROUTE) developed by the Office of Science and Technology in the Office of Water for conducting Total Daily Maximum Load analysis. PROUTE is a first-order decay model that accounts for chemical decay rates. It models pollutant concentrations downstream from facilities on a reach-by-reach basis for mean flow and low flow conditions. Stream delineations from the EPA Reach File 1 data set are used for displaying modeling results.

ESTAT uses PROUTE to model releases from either PCS or TRI facilities. Two types of PCS releases can be modeled: estimates of the total annual load of a particular contaminant, or an estimate of the

total annual load of a particular contaminant discharged above its permitted limit. ESTAT users can conduct two types of geographic analysis with the PROUTE mode

- **National Wildlife Refuges:** Users can select a National Wildlife Refuge located on a river segment, select a pollutant from a list (some 1,100 PCS parameters), and ESTAT will display all of the facilities upstream from the refuge discharging that pollutant. Concentrations of that pollutant downstream of each facility are color-coded by stream segment.

- **Facilities:** Users can select one or more facilities for downstream modeling.

All spatial and attribute data used by ESTAT Version 1.1 are processed from the Envirofacts Information Warehouse, which includes EPA Spatial Data Library System (ESDLS), the Envirofacts database, and the Oracle Demographic Database.

ESTAT Version 1.1 is available for use by EPA Headquarters and regional personnel. Those connected to appropriate Local Area Network (LAN) systems can use their PCs to access the ESTAT application on the *valley* UNIX server at Research Triangle Park (RTP), North Carolina. To run ESTAT, users need a copy of Hummingbird eXceed, or a similar UNIX X-windows emulator running under Windows 3.1 on a PC, and UNIX and Oracle accounts on the RTP server.

ESTAT Version 1.1 runs on a Digital Equipment Corporation (DEC) Alpha 8400 UNIX server, using ARC/INFO 7.1.1 and ORACLE 7.3.3.

PC desktop users wishing to access ESTAT must have at least a 486/66 MHZ PC with Windows 3.1 or Windows '95, Novell LAN WorkPlace for DOS or LAN WorkGroup, and HCL-eXceed/W V.5.0.1 installed.

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